



US006041109A

United States Patent [19][11] **Patent Number:** **6,041,109****Cardy et al.**[45] **Date of Patent:** ***Mar. 21, 2000****[54] TELECOMMUNICATIONS SYSTEM HAVING SEPARATE SWITCH INTELLIGENCE AND SWITCH FABRIC****[75] Inventors:** Douglas Ross Cardy, Plano; Ken Rambo, Dallas; Carol Waller, Allen, all of Tex.**[73] Assignee:** MCI Communications Corporation, Washington, D.C.**[*] Notice:** This patent issued on a continued prosecution application filed under 37 CFR 1.53(d), and is subject to the twenty year patent term provisions of 35 U.S.C. 154(a)(2).**[21] Appl. No.:** 08/580,712**[22] Filed:** Dec. 29, 1995**[51] Int. Cl.⁷** H04M 7/00; H04M 3/00**[52] U.S. Cl.** 379/201; 379/219; 379/220; 379/243**[58] Field of Search** 379/67, 88, 89, 379/201, 67.1, 210, 207, 216, 230, 93.05, 93.09, 93.15, 115, 121, 156, 196, 219, 220, 229, 242, 243**[56] References Cited****U.S. PATENT DOCUMENTS**

4,201,891	5/1980	Lawrence et al.	370/58
4,821,034	4/1989	Anderson et al.	340/825.8
4,872,157	10/1989	Hemmady et al.	370/60
4,893,302	1/1990	Hemmady et al.	370/58
5,272,749	12/1993	Masek	379/216
5,327,486	7/1994	Wolff et al.	379/96
5,329,520	7/1994	Richardson	370/16
5,418,844	5/1995	Morrissey et al.	379/207
5,530,852	6/1996	Meske, Jr. et al.	395/600
5,583,920	12/1996	Wheeler, Jr.	379/88

(List continued on next page.)

FOREIGN PATENT DOCUMENTS

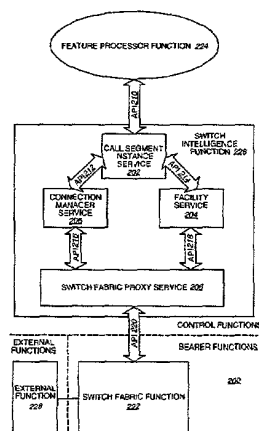
WO 95/29564 11/1995 WIPO.

OTHER PUBLICATIONSElixmann et al., "Open Switching—Extending Control Architectures to Facilitate Applications," *International Switching Symposium*, vol. 2, Apr. 23–28, 1995, Berlin, Germany, pp. 239–243.Kabay et al., "The Service Node—An Advanced IN Services Element," *BT Technology Journal*, vol. 13, No. 2, Apr. 1995, Ipswich, Great Britain, pp. 64–72.Mayer et al., "Service Net-2000: An Intelligent Network Evolution," *AT&T Technical Journal*, vol. 70, No. 3/4, 1991, Short Hills, USA, pp. 99–110.

(List continued on next page.)

Primary Examiner—Fan S. Tsang*Assistant Examiner*—Allan Hoosain**[57] ABSTRACT**

The present invention is a telecommunications system having separate switch fabric and switch intelligence. The system comprises a switch fabric, a switch intelligence, and a feature processor. The switch intelligence is logically separated from the switch fabric and comprises a switch fabric proxy, a facility service, a connection manager service, and a call segment instance service. The switch fabric proxy is coupled to the switch fabric via a vendor-specific first Application Programming Interface (API). The switch fabric proxy supports a second API, which is common across all vendors, representing functions supported by the switch fabric. A facility instance, which is instantiated by a facility service using a facility model, represents the bearer and signaling facilities of a party to a call, and interacts with the switch fabric proxy via the second API to communicate with the switch fabric. The connection manager service represents the connectors for a party to a call, and interacts with the switch fabric proxy via the second API to communicate with the switch fabric. A call segment instance, which is instantiated by a call segment instance service using a call model, represents the call logic and call data for a party to a call, and interacts with the connection manager service via a third API and with the facility instance via a fourth API. The feature processor interacts with the call segment instance via a fifth API to provide the telecommunications feature.

8 Claims, 5 Drawing Sheets

U.S. PATENT DOCUMENTS

5,608,446	3/1997	Carr et al.	348/6
5,610,976	3/1997	Uota et al.	379/127
5,619,557	4/1997	Van Berkum	379/88
5,619,562	4/1997	Maurer et al.	379/201
5,661,782	8/1997	Bartholomew et al.	379/67
5,712,908	1/1998	Brinkman et al.	379/119

OTHER PUBLICATIONS

Shabana et al., "Intelligent Switch Architecture," *Proceedings of the National Communications Forum*, vol. 42, No. 2, Sep. 30, 1988, Chicago, USA, pp. 1312-1320.

Maruyama, "A Concurrent Object-Oriented Switching Program in Chill," *IEEE Communications Magazine*, vol. 29, No. 1, Jan. 1991, New York, USA, pp. 60-68.